

Claims

1. Arrangement for treating a patient using proton therapy, comprising a proton beam guiding device employing magnets (7), quadrupoles (5), as well as an end-mounted proton beam guiding and control device (9) with an exit window (11) for guiding or directing the proton beam (3) to the treatment spot in the patient, as well as a controllably movable patient table (21) for moving the patient to the desired position relative to the proton beam, characterized in that the proton beam guiding and control device (9) is located so as to be turnable or rotatable by turning or rotating about a horizontal axis in such a way that the patient table located in essentially the plane of the axis of rotation remains accessible from the side, and characterized by rotating the patient table (21) in a horizontal plane running essentially through the axis of rotation or parallel to it and displaced by a small deviation around an axis which runs essentially through the isocenter of the arrangement, which isocenter is formed by the intersection of the proton beam with the axis of rotation or with the intersection by approximation of the beam with the axis of rotation.
2. Arrangement, especially according to Claim 1, characterized in that the beam guiding and control device (9) is arranged to be turnable or rotatable by at least 135° upwards and downwards from a horizontal plane running essentially through the axis of rotation.
3. Arrangement, especially according to Claim 1, characterized in that the beam guiding and control device (9) is arranged to be rotatable about the axis of rotation from a vertical plane

running essentially through the axis of rotation by an angle of 90° from the side of the vertical plane on which the patient table is located up to an angle of approximately 180° on the opposite side of the vertical plane.

4. Arrangement, especially according to Claim 1 or Claim 3, characterized in that the patient table (21) is arranged to be rotatable or movable in the region of the horizontal plane through which the beam guiding and control device (9) is not movable, or which region lies opposite the other region through which the beam guiding and control device (9) is movable.

5. Arrangement, especially according to Claims 1-4, characterized in that the patient table is preferably rotatable about an axis (27) in an end-mounted region on the patient table (21).

6. Arrangement, especially according to Claims 1-5, characterized in that the patient table is arranged to be slidable or movable in its longitudinal axis.

7. Arrangement, especially according to Claims 1-6, characterized in that the patient table is designed to be additionally rotatable about an axis running vertically in essentially the center region of the table, to be movable in a direction transverse to the longitudinal axis, and also to be adjustable in height.

8. Arrangement for treating a patient using proton therapy, comprising a proton beam guiding device employing magnets (6, 7), quadrupoles (5), and an end-mounted proton beam guiding and control device (9) with an exit window for directing the proton beam to the treatment spot in the patient, as well as a

controllably movable patient table (21) for moving the patient to the desired position relative to the proton beam (3), characterized in that a proton beam penetration depth adjustment device (31) is located in front of the arrangement before the magnets (7) and quadrupoles (5) and comprises a system of plates or blades movable in or through the proton beam so as to control or restrict the energy and the associated penetration depth of the proton beam in the patient.

9. Arrangement for treating a patient using proton therapy, comprising a proton beam guiding device employing magnets (7), quadrupoles (5), and an end-mounted proton beam guiding and control device (9) with an exit window for directing the proton beam to the treatment spot in the patient, as well as a controllably movable patient table (21) for moving the patient to the desired position relative to the proton beam (3), characterized in that the exit window (11), or a covering housing which is end-mounted on the proton beam guiding and control device and forms the exit window, is provided which is movement-coupled with the patient table (21) during treatment such that during treatment of the patient discrete movements effected by the patient table (21) are synchronously reproduced by the exit window or covering housing (11).

10. Arrangement, especially according to Claim 9, characterized in that an additional control device is provided for coupling the motion of the patient table (21) with the exit window or covering housing (11) during treatment of a patient.

11. Application of an arrangement according to one of Claims 1-10 for treating a patient using proton therapy, characterized in that a person lying on the patient table is positioned by moving the patient table and proton beam guiding and control

device such that the proton beam is directed to the treatment spot in the patient and that the patient table remains accessible at all times from one side.

12. Application, especially according to Claim 11, characterized in that the proton beam guiding and control device and the patient table are positioned around one axis - the proton beam guiding and control device by turning or rotating about a horizontal axis of rotation and the patient table by turning in a horizontal plane running essentially through the horizontal axis of rotation or parallel to this and arranged so as to be displaced by a small deviation - which one axis runs essentially through the isocenter of the arrangement, which isocenter is formed by the intersection of the proton beam with the axis of rotation or with the intersection by approximation of the beam with the axis of rotation.

13. Application, especially according to Claim 11 or Claim 12, characterized in that the energy, and associated with this, the penetration depth of the proton beam in the patient is controlled or restricted by means of a proton beam penetration adjustment device located in front of the arrangement before the magnets (7) and quadrupoles (5) and comprising a system of plates or blades movable in or through the proton beam.

14. Application according to one of Claims 11-13 for destroying a malignant organ or tumor in a human body.

